CETIFICATION

SDG No:	FA33878	Laboratory:	Accutest, Florida
Site:	BMS, Building 5 Area, PR	Matrix:	Groundwater/Soil
	Humacao, PR		

SUMMARY: Groundwater and soil samples (Table 1) were collected on the BMSMC facility – Building 5 Area. The BMSMC facility is located in Humacao, PR. Samples were taken May 10-11, 2016 and were analyzed in Accutest Laboratory of Orlando, Florida that reported the data under SDG No.: FA33878. Results were validated using the latest validation guidelines (July, 2015) of the EPA Hazardous Waste Support Section. The analyses performed are shown in Table 1. Individual data review worksheets are enclosed for each target analyte group. The data sample organic data samples summary form shows for analytes results that were qualified.

In summary the results are valid and can be used for decision taking purposes.

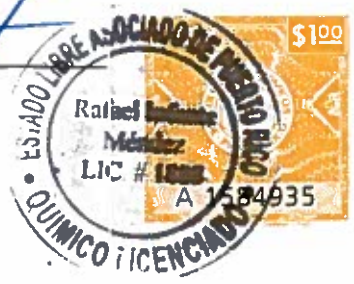
Table 1. Samples analyzed and analysis performed

SAMPLE ID	SAMPLE DESCRIPTION	MATRIX	ANALYSIS PERFORMED
FA33878-1	RA19-GWS	Groundwater	VOCs TCL List
FA33878-2	BPEB-17	AQ - Equipment Blank	VOCs TCL List
FA33878-3	RA-19 (5-6)	Soil	VOCs TCL List
FA33878-4	RA-19 (6.2-7.2)	Soil	VOCs TCL List
FA33878-5	S-39S	Groundwater	VOCs TCL List
FA33878-6	RA19-GWD	Groundwater	VOCs TCL List

Reviewer Name: Rafael Infante
Chemist License 1888

Signature:

Date: May 30, 2016



SGS Accutest

Report of Analysis

Client Sample ID:	RA19-GWS		
Lab Sample ID:	FA33878-1	**Date Sampled:**	05/10/16
Matrix:	AQ - Ground Water	**Date Received:**	05/12/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J0976458.D	1	05/12/16	DP	n/a	n/a	VJ5295
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
100-44-7	Benzyl Chloride	ND	2.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.46	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.6	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.23	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.30	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.63	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
110-82-7	Cyclohexane	ND	1.0	0.26	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.26	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	0.81	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	0.33	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.27	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.24	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.39	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.26	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.28	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.22	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.31	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.33	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	44.7	1.0	0.25	ug/l	
76-13-1	Freon 113	ND	1.0	0.32	ug/l	
591-78-6	2-Hexanone	ND	10	2.0	ug/l	
98-82-8	Isopropylbenzene	23.0	1.0	0.33	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA19-GWS		
Lab Sample ID:	FA33878-1	**Date Sampled:**	05/10/16
Matrix:	AQ - Ground Water	**Date Received:**	05/12/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, Humacao, PR		

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
99-87-6	p-Isopropyltoluene	ND	1.0	0.28	ug/l	
79-20-9	Methyl Acetate	ND	20	5.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.50	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
108-87-2	Methylcyclohexane	ND	1.0	0.23	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	1.7	5.0	1.4	ug/l	J
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.20	ug/l	
100-42-5	Styrene	ND	1.0	0.24	ug/l	
75-85-4	Tert-Amyl Alcohol	ND	20	6.0	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	20	9.1	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.33	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.30	ug/l	
109-99-9	Tetrahydrofuran	ND	5.0	1.4	ug/l	
108-88-3	Toluene	ND	1.0	0.20	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	0.51	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.20	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.37	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.27	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	0.20	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.31	ug/l	
	m,p-Xylene	38.9	2.0	0.30	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		83-118%
17060-07-0	1,2-Dichloroethane-D4	106%		79-125%
2037-26-5	Toluene-D8	99%		85-112%
460-00-4	4-Bromofluorobenzene	106%		83-118%

ND = Not detected MDL = Method Detection Limit
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E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	BPEB-17		
Lab Sample ID:	FA33878-2	**Date Sampled:**	05/10/16
Matrix:	AQ - Equipment Blank	**Date Received:**	05/12/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J0976459.D	1	05/12/16	DP	n/a	n/a	VJ5295
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
100-44-7	Benzyl Chloride	ND	2.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.46	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.6	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.23	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.30	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.63	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
110-82-7	Cyclohexane	ND	1.0	0.26	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.26	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	0.81	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	0.33	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.27	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.24	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.39	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.26	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.28	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.22	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.31	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.33	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.25	ug/l	
76-13-1	Freon 113	ND	1.0	0.32	ug/l	
591-78-6	2-Hexanone	ND	10	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.33	ug/l	

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ND = Not detected MDL = Method Detection Limit
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E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BPEB-17		
Lab Sample ID:	FA33878-2	**Date Sampled:**	05/10/16
Matrix:	AQ - Equipment Blank	**Date Received:**	05/12/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, Humacao, PR		

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
99-87-6	p-Isopropyltoluene	ND	1.0	0.28	ug/l	
79-20-9	Methyl Acetate	ND	20	5.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.50	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
108-87-2	Methylcyclohexane	ND	1.0	0.23	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.4	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.20	ug/l	
100-42-5	Styrene	ND	1.0	0.24	ug/l	
75-85-4	Tert-Amyl Alcohol	ND	20	6.0	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	20	9.1	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.33	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.30	ug/l	
109-99-9	Tetrahydrofuran	ND	5.0	1.4	ug/l	
108-88-3	Toluene	ND	1.0	0.20	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	0.51	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.20	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.37	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.27	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	0.20	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.31	ug/l	
	m,p-Xylene	ND	2.0	0.30	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		83-118%
17060-07-0	1,2-Dichloroethane-D4	105%		79-125%
2037-26-5	Toluene-D8	104%		85-112%
460-00-4	4-Bromofluorobenzene	106%		83-118%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA-19 (5-6)		
Lab Sample ID:	FA33878-3	**Date Sampled:**	05/11/16
Matrix:	SO - Soil	**Date Received:**	05/12/16
Method:	SW846 8260C SW846 5035	**Percent Solids:**	78.5
Project:	BMSMC, Building 5 Area, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0115596.D	1	05/12/16	EP	05/12/16 11:51	n/a	VC4595
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.49 g	5.0 ml	100 ul
Run #2			

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	3600	730	ug/kg	
71-43-2	Benzene	ND	360	90	ug/kg	
100-44-7	Benzyl Chloride	ND	360	100	ug/kg	
74-97-5	Bromochloromethane	ND	360	80	ug/kg	
75-27-4	Bromodichloromethane	ND	360	72	ug/kg	
75-25-2	Bromoform	ND	360	72	ug/kg	
78-93-3	2-Butanone (MEK)	ND	1800	650	ug/kg	
75-15-0	Carbon Disulfide	ND	360	72	ug/kg	
56-23-5	Carbon Tetrachloride	ND	360	130	ug/kg	
108-90-7	Chlorobenzene	ND	360	72	ug/kg	
75-00-3	Chloroethane	ND	360	140	ug/kg	
67-66-3	Chloroform	ND	360	87	ug/kg	
110-82-7	Cyclohexane	ND	360	87	ug/kg	
124-48-1	Dibromochloromethane	ND	360	72	ug/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	360	160	ug/kg	
106-93-4	1,2-Dibromoethane	ND	360	72	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	360	180	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	360	72	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	360	72	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	360	73	ug/kg	
75-34-3	1,1-Dichloroethane	ND	360	120	ug/kg	
107-06-2	1,2-Dichloroethane	ND	360	72	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	360	72	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	360	86	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	360	110	ug/kg	
78-87-5	1,2-Dichloropropane	ND	360	110	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	360	140	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	360	72	ug/kg	
100-41-4	Ethylbenzene	3990	360	78	ug/kg	
76-13-1	Freon 113	ND	360	84	ug/kg	
591-78-6	2-Hexanone	ND	1800	630	ug/kg	
98-82-8	Isopropylbenzene	ND	360	100	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA-19 (5-6)		
Lab Sample ID:	FA33878-3	**Date Sampled:**	05/11/16
Matrix:	SO - Soil	**Date Received:**	05/12/16
Method:	SW846 8260C SW846 5035	**Percent Solids:**	78.5
Project:	BMSMC, Building 5 Area, Humacao, PR		

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
99-87-6	p-Isopropyltoluene	ND	360	72	ug/kg	
79-20-9	Methyl Acetate	ND	1800	620	ug/kg	
74-83-9	Methyl Bromide	ND	360	180	ug/kg	
74-87-3	Methyl Chloride	ND	360	170	ug/kg	
108-87-2	Methylcyclohexane	ND	360	72	ug/kg	
75-09-2	Methylene Chloride	ND	720	290	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	1800	770	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	360	80	ug/kg	
100-42-5	Styrene	ND	360	72	ug/kg	
75-85-4	Tert-Amyl Alcohol	ND	3600	970	ug/kg	
75-65-0	Tert-Butyl Alcohol	ND	3600	980	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	360	160	ug/kg	
127-18-4	Tetrachloroethylene	ND	360	94	ug/kg	
109-99-9	Tetrahydrofuran	ND	720	260	ug/kg	
108-88-3	Toluene	ND	360	81	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	360	140	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	360	110	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	360	72	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	360	130	ug/kg	
79-01-6	Trichloroethylene	ND	360	84	ug/kg	
75-69-4	Trichlorofluoromethane	ND	360	130	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	360	72	ug/kg	
75-01-4	Vinyl Chloride	ND	360	120	ug/kg	
	m,p-Xylene	6820	720	130	ug/kg	
95-47-6	o-Xylene	ND	360	79	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		75-124%
17060-07-0	1,2-Dichloroethane-D4	90%		72-135%
2037-26-5	Toluene-D8	97%		75-126%
460-00-4	4-Bromofluorobenzene	100%		71-133%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA-19 (6.2-7.2)		
Lab Sample ID:	FA33878-4	**Date Sampled:**	05/11/16
Matrix:	SO - Soil	**Date Received:**	05/12/16
Method:	SW846 8260C SW846 5035	**Percent Solids:**	76.1
Project:	BMSMC, Building 5 Area, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0115598.D	1	05/12/16	EP	05/12/16 11:57	n/a	VC4595
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.53 g	5.0 ml	100 ul
Run #2			

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	3800	770	ug/kg	
71-43-2	Benzene	ND	380	95	ug/kg	
100-44-7	Benzyl Chloride	ND	380	100	ug/kg	
74-97-5	Bromochloromethane	ND	380	83	ug/kg	
75-27-4	Bromodichloromethane	ND	380	75	ug/kg	
75-25-2	Bromoform	ND	380	75	ug/kg	
78-93-3	2-Butanone (MEK)	ND	1900	680	ug/kg	
75-15-0	Carbon Disulfide	ND	380	75	ug/kg	
56-23-5	Carbon Tetrachloride	ND	380	130	ug/kg	
108-90-7	Chlorobenzene	ND	380	75	ug/kg	
75-00-3	Chloroethane	ND	380	150	ug/kg	
67-66-3	Chloroform	ND	380	92	ug/kg	
110-82-7	Cyclohexane	ND	380	92	ug/kg	
124-48-1	Dibromochloromethane	ND	380	75	ug/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	380	170	ug/kg	
106-93-4	1,2-Dibromoethane	ND	380	75	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	380	190	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	380	75	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	380	75	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	380	77	ug/kg	
75-34-3	1,1-Dichloroethane	ND	380	130	ug/kg	
107-06-2	1,2-Dichloroethane	ND	380	75	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	380	75	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	380	90	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	380	110	ug/kg	
78-87-5	1,2-Dichloropropane	ND	380	120	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	380	140	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	380	75	ug/kg	
100-41-4	Ethylbenzene	4220	380	82	ug/kg	
76-13-1	Freon 113	ND	380	88	ug/kg	
591-78-6	2-Hexanone	ND	1900	660	ug/kg	
98-82-8	Isopropylbenzene	ND	380	110	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA-19 (6.2-7.2)		
Lab Sample ID:	FA33878-4	**Date Sampled:**	05/11/16
Matrix:	SO - Soil	**Date Received:**	05/12/16
Method:	SW846 8260C SW846 5035	**Percent Solids:**	76.1
Project:	BMSMC, Building 5 Area, Humacao, PR		

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
99-87-6	p-Isopropyltoluene	ND	380	75	ug/kg	
79-20-9	Methyl Acetate	ND	1900	640	ug/kg	
74-83-9	Methyl Bromide	ND	380	190	ug/kg	
74-87-3	Methyl Chloride	ND	380	180	ug/kg	
108-87-2	Methylcyclohexane	ND	380	75	ug/kg	
75-09-2	Methylene Chloride	ND	750	300	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	1900	800	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	380	83	ug/kg	
100-42-5	Styrene	ND	380	75	ug/kg	
75-85-4	Tert-Amyl Alcohol	ND	3800	1000	ug/kg	
75-65-0	Tert-Butyl Alcohol	ND	3800	1000	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	380	170	ug/kg	
127-18-4	Tetrachloroethylene	ND	380	98	ug/kg	
109-99-9	Tetrahydrofuran	ND	750	270	ug/kg	
108-88-3	Toluene	ND	380	85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	380	150	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	380	110	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	380	75	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	380	140	ug/kg	
79-01-6	Trichloroethylene	ND	380	88	ug/kg	
75-69-4	Trichlorofluoromethane	ND	380	140	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	380	75	ug/kg	
75-01-4	Vinyl Chloride	ND	380	130	ug/kg	
	m,p-Xylene	7410	750	130	ug/kg	
95-47-6	o-Xylene	ND	380	83	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		75-124%
17060-07-0	1,2-Dichloroethane-D4	94%		72-135%
2037-26-5	Toluene-D8	96%		75-126%
460-00-4	4-Bromofluorobenzene	101%		71-133%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	S-39S		
Lab Sample ID:	FA33878-5	**Date Sampled:**	05/11/16
Matrix:	AQ - Ground Water	**Date Received:**	05/12/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J0976460.D	1	05/12/16	DP	n/a	n/a	VJ5295
Run #2	J0976474.D	100	05/13/16	DP	n/a	n/a	VJ5296

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	0.30	1.0	0.20	ug/l	J
100-44-7	Benzyl Chloride	ND	2.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.46	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.6	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.23	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.30	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.63	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
110-82-7	Cyclohexane	ND	1.0	0.26	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.26	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	0.81	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	0.33	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.27	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.24	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.39	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.26	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.28	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.22	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.31	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.33	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	1670 [a]	100	25	ug/l	
76-13-1	Freon 113	ND	1.0	0.32	ug/l	
591-78-6	2-Hexanone	ND	10	2.0	ug/l	
98-82-8	Isopropylbenzene	21.5	1.0	0.33	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	S-39S		
Lab Sample ID:	FA33878-5	**Date Sampled:**	05/11/16
Matrix:	AQ - Ground Water	**Date Received:**	05/12/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, Humacao, PR		

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
99-87-6	p-Isopropyltoluene	ND	1.0	0.28	ug/l	
79-20-9	Methyl Acetate	ND	20	5.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.50	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
108-87-2	Methylcyclohexane	ND	1.0	0.23	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.4	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.25	1.0	0.20	ug/l	J
100-42-5	Styrene	ND	1.0	0.24	ug/l	
75-85-4	Tert-Amyl Alcohol	ND	20	6.0	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	20	9.1	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.33	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.30	ug/l	
109-99-9	Tetrahydrofuran	ND	5.0	1.4	ug/l	
108-88-3	Toluene	4.8	1.0	0.20	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	0.51	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.20	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.37	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.27	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	0.20	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.31	ug/l	
	m,p-Xylene	5440 [a]	200	30	ug/l	
95-47-6	o-Xylene	395 [a]	100	26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	79-125%
2037-26-5	Toluene-D8	97%	101%	85-112%
460-00-4	4-Bromofluorobenzene	109%	103%	83-118%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA19-GWD		
Lab Sample ID:	FA33878-6	**Date Sampled:**	05/11/16
Matrix:	AQ - Ground Water	**Date Received:**	05/12/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J0976471.D	1	05/13/16	DP	n/a	n/a	VJ5296
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
100-44-7	Benzyl Chloride	ND	2.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.46	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.6	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.23	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.30	ug/l	
108-90-7	Chlorobenzene	0.55	1.0	0.20	ug/l	J
75-00-3	Chloroethane	ND	2.0	0.63	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
110-82-7	Cyclohexane	ND	1.0	0.26	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.26	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	0.81	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	0.33	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.27	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.24	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.39	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.26	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.28	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.22	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.31	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.33	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	0.64	1.0	0.25	ug/l	J
76-13-1	Freon 113	ND	1.0	0.32	ug/l	
591-78-6	2-Hexanone	ND	10	2.0	ug/l	
98-82-8	Isopropylbenzene	2.4	1.0	0.33	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA19-GWD		
Lab Sample ID:	FA33878-6	**Date Sampled:**	05/11/16
Matrix:	AQ - Ground Water	**Date Received:**	05/12/16
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, Humacao, PR		

VOA TCL List (SOM02.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
99-87-6	p-Isopropyltoluene	ND	1.0	0.28	ug/l	
79-20-9	Methyl Acetate	ND	20	5.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.50	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
108-87-2	Methylcyclohexane	ND	1.0	0.23	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.4	ug/l	
1634-04-4	Methyl Tert Butyl Ether	2.4	1.0	0.20	ug/l	
100-42-5	Styrene	ND	1.0	0.24	ug/l	
75-85-4	Tert-Amyl Alcohol	ND	20	6.0	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	20	9.1	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.33	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.30	ug/l	
109-99-9	Tetrahydrofuran	ND	5.0	1.4	ug/l	
108-88-3	Toluene	ND	1.0	0.20	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	0.51	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.20	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.37	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.27	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	0.20	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.31	ug/l	
	m,p-Xylene	0.87	2.0	0.30	ug/l	J
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	100%		79-125%
2037-26-5	Toluene-D8	102%		85-112%
460-00-4	4-Bromofluorobenzene	106%		83-118%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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FA33878
809960569680

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Get from NJ

Company Name: Anderson Mulholland Assoc Inc.
Project Name: BMS Release Assessment
Street Address: 2700 Westchester
City / State: Purchase, NY
Project Contact: Terry Taylor
Phone #: 914-251-0400
Sampler(s) Name(s): N. Rivera, T. Taylor, D. Lindstrand

Billing Information (if different from Report to)

Analysis: VOC - Method 8260C

Sample #	Field ID / Point of Collection	Date	Time	Sampled by	Matrix	# of bottles	HCl	MeOH	DI Water	ENCORE	VOC - Method 8260C
1	RA 19-GWS	05/10/16	1610	TT	GW	3	3				X
2	BPEB-17	05/10/16	1700	TT	EB	3	3				X
3	RA-19 (5-6)	05/11/16	0950	TT	SO	4		1		3	X
4	RA-19 (6.2-7.2)	05/11/16	1015	TT	SO	4		1		3	X
5	S-395	05/11/16	1325	NR	GW	3	3				X
6	RA19-GWD	05/11/16	1500	TT	GW	3	3				X

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL - Sludge, SED - Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB - Field Blank, EB - Equipment Blank, RB - Rinse Blank, TB - Trip Blank

LAB USE ONLY

Turnaround Time (Business days)

- [x] Std. 10 Business Days For soil samples
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [x] 1 Day RUSH For aqueous samples
- [ ] other

Emergency & Rush T/A data available VIA Lablink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [x] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only, Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Add to Report: Tetrahydrofuran, p-Isopropyl toluene, 1-2-4 Trimethyl benzene, Benzyl chloride, Tetra amyl chloride

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by	Date Time	Received By	Relinquished By	Date Time	Received By
1 [signature]	05/11/16 1530	1 FedEx	2 Fx		2 [signature] 5/12/16 915
3		3	4		4
5		5	Custody Seal # 372	☐ Intact ☐ Not intact	Preserved where applicable ☐ On Ice ☐ (1) Cooler Temp. 3.8

5.1

5

FA33878: Chain of Custody
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EXECUTIVE NARRATIVE

SDG No:	**FA33878**	Laboratory:	**Accutest, Florida**
Analysis:	**SW846-8260C**	Number of Samples:	**6**
Location:	BMSMC, Building 5 Area Humacao, PR		

SUMMARY: Six (6) samples analyzed for VOAs TCL list by method SW846-8260C. Samples were validated following USEPA Hazardous Waste Support Section SOP No. HW-33A Revision 0 SOM02.2. Low/Medium Volatile Data Validation. July, 2015.The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings:

1. MS/MSD soil matrix samples reported for this batch was a sample from another project. MS/MSD results apply only to the unspiked sample. Analytes not meeting the laboratory control limits were not qualified.

2. FA33878-1 MS/MSD analyzed for this batch. Analytes (Ethylbenzene and tert-butyl alcohol) over the recovery upper control limit qualified as estimated (J) for positive results, non-detects are accepted.

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: 

Date: May 30, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: FA33878-1
Sample location: BMSMC Building 5 Area
Sampling date: 5/10/2016
Matrix: Groundwater

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	25	ug/L	1.0	-	U	Yes
Benzene	1.0	ug/L	1.0	-	U	Yes
Benzyl Chloride	2.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	1.0	ug/L	1.0	-	U	Yes
2-Butanone (MEK)	5.0	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	1.0	ug/L	1.0	-	U	Yes
Chloroethane	2.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Cyclohexane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromo-3-chloropropane	5.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	2.0	ug/L	1.0	-	U	Yes
Dichlorodifluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes

trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes
cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	44.7	ug/L	1.0	-	J	Yes
Freon 113	1.0	ug/L	1.0	-	U	Yes
2-Hexanone	10	ug/L	1.0	-	U	Yes
Isopropylbenzene	23.0	ug/L	1.0	-	-	Yes
p-Isopropyltoluene	1.0	ug/L	1.0	-	U	Yes
Methyl Acetate	20	ug/L	1.0	-	U	Yes
Methyl Bromide	2.0	ug/L	1.0	-	U	Yes
Methyl Chloride	2.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	1.0	ug/L	1.0	-	U	Yes
Methylene chloride	5.0	ug/L	1.0	-	U	Yes
4-Methyl-2-pentanone(MIBK)	1.7	ug/L	1.0	J	UJ	Yes
Methyl Tert Butyl Ether	1.0	ug/L	1.0	-	U	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
Tert-Amyl Alcohol	20	ug/L	1.0	-	U	Yes
Tert-Butyl Alcohol	20	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	1.0	ug/L	1.0	-	U	Yes
Tetrahydrofuran	5.0	ug/L	1.0	-	U	Yes
Toluene	1.0	ug/L	1.0	-	U	Yes
1,2,3-Trichlorobenzene	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	2.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	1.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trimethylbenzene	1.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	38.9	ug/L	1.0	-	-	Yes
o-Xylene	1.0	ug/L	1.0	-	U	Yes

Sample ID: FA33878-2
Sample location: BMSMC Building 5 Area
Sampling date: 5/10/2016
Matrix: AQ - Equipment Blank

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	25	ug/L	1.0	-	U	Yes
Benzene	1.0	ug/L	1.0	-	U	Yes
Benzyl Chloride	2.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	1.0	ug/L	1.0	-	U	Yes
2-Butanone (MEK)	5.0	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	1.0	ug/L	1.0	-	U	Yes
Chloroethane	2.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Cyclohexane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromo-3-chloropropane	5.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	2.0	ug/L	1.0	-	U	Yes
Dichlorodifluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes

cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	1.0	ug/L	1.0	-	U	Yes
Freon 113	1.0	ug/L	1.0	-	U	Yes
2-Hexanone	10	ug/L	1.0	-	U	Yes
Isopropylbenzene	1.0	ug/L	1.0	-	U	Yes
p-Isopropyltoluene	1.0	ug/L	1.0	-	U	Yes
Methyl Acetate	20	ug/L	1.0	-	U	Yes
Methyl Bromide	2.0	ug/L	1.0	-	U	Yes
Methyl Chloride	2.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	1.0	ug/L	1.0	-	U	Yes
Methylene chloride	5.0	ug/L	1.0	-	U	Yes
4-Methyl-2-pentanone(MIBK)	5.0	ug/L	1.0	-	U	Yes
Methyl Tert Butyl Ether	1.0	ug/L	1.0	-	U	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
Tert-Amyl Alcohol	20	ug/L	1.0	-	U	Yes
Tert-Butyl Alcohol	20	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	1.0	ug/L	1.0	-	U	Yes
Tetrahydrofuran	5.0	ug/L	1.0	-	U	Yes
Toluene	1.0	ug/L	1.0	-	U	Yes
1,2,3-Trichlorobenzene	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	2.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	1.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trimethylbenzene	1.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	2.0	ug/L	1.0	-	U	Yes
o-Xylene	1.0	ug/L	1.0	-	U	Yes

Sample ID: FA33878-3
Sample location: BMSMC Building 5 Area
Sampling date: 5/11/2016
Matrix: Soil

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	3600	ug/Kg	1.0	-	U	Yes
Benzene	360	ug/Kg	1.0	-	U	Yes
Benzyl Chloride	360	ug/Kg	1.0	-	U	Yes
Bromochloromethane	360	ug/Kg	1.0	-	U	Yes
Bromodichloromethane	360	ug/Kg	1.0	-	U	Yes
Bromoform	360	ug/Kg	1.0	-	U	Yes
2-Butanone (MEK)	1800	ug/Kg	1.0	-	U	Yes
Carbon disulfide	360	ug/Kg	1.0	-	U	Yes
Carbon tetrachloride	360	ug/Kg	1.0	-	U	Yes
Chlorobenzene	360	ug/Kg	1.0	-	U	Yes
Chloroethane	360	ug/Kg	1.0	-	U	Yes
Chloroform	360	ug/Kg	1.0	-	U	Yes
Cyclohexane	360	ug/Kg	1.0	-	U	Yes
Dibromochloromethane	360	ug/Kg	1.0	-	U	Yes
1,2-Dibromo-3-chloropropane	360	ug/Kg	1.0	-	U	Yes
1,2-Dibromoethane	360	ug/Kg	1.0	-	U	Yes
Dichlorodifluoromethane	360	ug/Kg	1.0	-	U	Yes
1,2-Dichlorobenzene	360	ug/Kg	1.0	-	U	Yes
1,3-Dichlorobenzene	360	ug/Kg	1.0	-	U	Yes
1,4-Dichlorobenzene	360	ug/Kg	1.0	-	U	Yes
1,1-Dichloroethane	360	ug/Kg	1.0	-	U	Yes
1,2-Dichloroethane	360	ug/Kg	1.0	-	U	Yes
1,1-Dichloroethene	360	ug/Kg	1.0	-	U	Yes
cis-1,2-Dichloroethene	360	ug/Kg	1.0	-	U	Yes
trans-1,2-Dichloroethene	360	ug/Kg	1.0	-	U	Yes
1,2-Dichloropropane	360	ug/Kg	1.0	-	U	Yes

cis-1,3-Dichloropropene	360	ug/Kg	1.0	-	U	Yes
trans-1,3-Dichloropropene	360	ug/Kg	1.0	-	U	Yes
Ethylbenzene	3990	ug/Kg	1.0	-	-	Yes
Freon 113	360	ug/Kg	1.0	-	U	Yes
2-Hexanone	1800	ug/Kg	1.0	-	U	Yes
Isopropylbenzene	360	ug/Kg	1.0	-	U	Yes
p-Isopropyltoluene	360	ug/Kg	1.0	-	U	Yes
Methyl Acetate	1800	ug/Kg	1.0	-	U	Yes
Methyl Bromide	360	ug/Kg	1.0	-	U	Yes
Methyl Chloride	360	ug/Kg	1.0	-	U	Yes
Methylcyclohexane	360	ug/Kg	1.0	-	U	Yes
Methylene chloride	720	ug/Kg	1.0	-	U	Yes
4-Methyl-2-pentanone(MIBK)	1800	ug/Kg	1.0	-	U	Yes
Methyl Tert Butyl Ether	360	ug/Kg	1.0	-	U	Yes
Styrene	360	ug/Kg	1.0	-	U	Yes
Tert-Amyl Alcohol	3600	ug/Kg	1.0	-	U	Yes
Tert-Butyl Alcohol	3600	ug/Kg	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	360	ug/Kg	1.0	-	U	Yes
Tetrachloroethene	360	ug/Kg	1.0	-	U	Yes
Tetrahydrofuran	720	ug/Kg	1.0	-	U	Yes
Toluene	360	ug/Kg	1.0	-	U	Yes
1,2,3-Trichlorobenzene	360	ug/Kg	1.0	-	U	Yes
1,2,4-Trichlorobenzene	360	ug/Kg	1.0	-	U	Yes
1,1,1-Trichloroethane	360	ug/Kg	1.0	-	U	Yes
1,1,2-Trichloroethane	360	ug/Kg	1.0	-	U	Yes
Trichloroethene	360	ug/Kg	1.0	-	U	Yes
Trichlorofluoromethane	360	ug/Kg	1.0	-	U	Yes
1,2,4-Trimethylbenzene	360	ug/Kg	1.0	-	U	Yes
Vinyl chloride	360	ug/Kg	1.0	-	U	Yes
m,p-Xylene	6820	ug/Kg	1.0	-	-	Yes
o-Xylene	360	ug/Kg	1.0	-	U	Yes

Sample ID: FA33878-4
Sample location: BMSMC Building 5 Area
Sampling date: 5/11/2016
Matrix: Soil

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	3800	ug/Kg	1.0	-	U	Yes
Benzene	380	ug/Kg	1.0	-	U	Yes
Benzyl Chloride	380	ug/Kg	1.0	-	U	Yes
Bromochloromethane	380	ug/Kg	1.0	-	U	Yes
Bromodichloromethane	380	ug/Kg	1.0	-	U	Yes
Bromoform	380	ug/Kg	1.0	-	U	Yes
2-Butanone (MEK)	1900	ug/Kg	1.0	-	U	Yes
Carbon disulfide	380	ug/Kg	1.0	-	U	Yes
Carbon tetrachloride	380	ug/Kg	1.0	-	U	Yes
Chlorobenzene	380	ug/Kg	1.0	-	U	Yes
Chloroethane	380	ug/Kg	1.0	-	U	Yes
Chloroform	380	ug/Kg	1.0	-	U	Yes
Cyclohexane	380	ug/Kg	1.0	-	U	Yes
Dibromochloromethane	380	ug/Kg	1.0	-	U	Yes
1,2-Dibromo-3-chloropropane	380	ug/Kg	1.0	-	U	Yes
1,2-Dibromoethane	380	ug/Kg	1.0	-	U	Yes
Dichlorodifluoromethane	380	ug/Kg	1.0	-	U	Yes
1,2-Dichlorobenzene	380	ug/Kg	1.0	-	U	Yes
1,3-Dichlorobenzene	380	ug/Kg	1.0	-	U	Yes
1,4-Dichlorobenzene	380	ug/Kg	1.0	-	U	Yes
1,1-Dichloroethane	380	ug/Kg	1.0	-	U	Yes
1,2-Dichloroethane	380	ug/Kg	1.0	-	U	Yes
1,1-Dichloroethene	380	ug/Kg	1.0	-	U	Yes
cis-1,2-Dichloroethene	380	ug/Kg	1.0	-	U	Yes
trans-1,2-Dichloroethene	380	ug/Kg	1.0	-	U	Yes
1,2-Dichloropropane	380	ug/Kg	1.0	-	U	Yes

cis-1,3-Dichloropropene	380	ug/Kg	1.0	-	U	Yes
trans-1,3-Dichloropropene	380	ug/Kg	1.0	-	U	Yes
Ethylbenzene	4220	ug/Kg	1.0	-	-	Yes
Freon 113	380	ug/Kg	1.0	-	U	Yes
2-Hexanone	1900	ug/Kg	1.0	-	U	Yes
Isopropylbenzene	380	ug/Kg	1.0	-	U	Yes
p-Isopropyltoluene	380	ug/Kg	1.0	-	U	Yes
Methyl Acetate	380	ug/Kg	1.0	-	U	Yes
Methyl Bromide	380	ug/Kg	1.0	-	U	Yes
Methyl Chloride	380	ug/Kg	1.0	-	U	Yes
Methylcyclohexane	380	ug/Kg	1.0	-	U	Yes
Methylene chloride	750	ug/Kg	1.0	-	U	Yes
4-Methyl-2-pentanone(MIBK)	1900	ug/Kg	1.0	-	U	Yes
Methyl Tert Butyl Ether	380	ug/Kg	1.0	-	U	Yes
Styrene	380	ug/Kg	1.0	-	U	Yes
Tert-Amyl Alcohol	3800	ug/Kg	1.0	-	U	Yes
Tert-Butyl Alcohol	3800	ug/Kg	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	380	ug/Kg	1.0	-	U	Yes
Tetrachloroethene	380	ug/Kg	1.0	-	U	Yes
Tetrahydrofuran	750	ug/Kg	1.0	-	U	Yes
Toluene	380	ug/Kg	1.0	-	U	Yes
1,2,3-Trichlorobenzene	380	ug/Kg	1.0	-	U	Yes
1,2,4-Trichlorobenzene	380	ug/Kg	1.0	-	U	Yes
1,1,1-Trichloroethane	380	ug/Kg	1.0	-	U	Yes
1,1,2-Trichloroethane	380	ug/Kg	1.0	-	U	Yes
Trichloroethene	380	ug/Kg	1.0	-	U	Yes
Trichlorofluoromethane	380	ug/Kg	1.0	-	U	Yes
1,2,4-Trimethylbenzene	380	ug/Kg	1.0	-	U	Yes
Vinyl chloride	380	ug/Kg	1.0	-	U	Yes
m,p-Xylene	7410	ug/Kg	1.0	-	-	Yes
o-Xylene	380	ug/Kg	1.0	-	U	Yes

Sample ID: FA33878-5
Sample location: BMSMC Building 5 Area
Sampling date: 5/11/2016
Matrix: Groundwater

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	25	ug/L	1.0	-	U	Yes
Benzene	0.30	ug/L	1.0	J	UJ	Yes
Benzyl Chloride	2.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	1.0	ug/L	1.0	-	U	Yes
2-Butanone (MEK)	5.0	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	1.0	ug/L	1.0	-	U	Yes
Chloroethane	2.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Cyclohexane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromo-3-chloropropane	5.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	2.0	ug/L	1.0	-	U	Yes
Dichlorodifluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes

cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	1670	ug/L	100	-	-	Yes
Freon 113	1.0	ug/L	1.0	-	U	Yes
2-Hexanone	10	ug/L	1.0	-	U	Yes
Isopropylbenzene	21.5	ug/L	1.0	-	-	Yes
p-Isopropyltoluene	1.0	ug/L	1.0	-	U	Yes
Methyl Acetate	20	ug/L	1.0	-	U	Yes
Methyl Bromide	2.0	ug/L	1.0	-	U	Yes
Methyl Chloride	2.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	1.0	ug/L	1.0	-	U	Yes
Methylene chloride	5.0	ug/L	1.0	-	U	Yes
4-Methyl-2-pentanone(MIBK)	5.0	ug/L	1.0	-	U	Yes
Methyl Tert Butyl Ether	0.25	ug/L	1.0	J	UJ	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
Tert-Amyl Alcohol	20	ug/L	1.0	-	U	Yes
Tert-Butyl Alcohol	20	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	1.0	ug/L	1.0	-	U	Yes
Tetrahydrofuran	5.0	ug/L	1.0	-	U	Yes
Toluene	4.8	ug/L	1.0	-	-	Yes
1,2,3-Trichlorobenzene	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	2.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	1.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trimethylbenzene	1.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	5440	ug/L	100	-	U	Yes
o-Xylene	395	ug/L	100	-	U	Yes

Sample ID: FA33878-6
Sample location: BMSMC Building 5 Area
Sampling date: 5/11/2016
Matrix: Groundwater

METHOD: 8260C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Acetone	25	ug/L	1.0	-	U	Yes
Benzene	1.0	ug/L	1.0	-	U	Yes
Benzyl Chloride	2.0	ug/L	1.0	-	U	Yes
Bromochloromethane	1.0	ug/L	1.0	-	U	Yes
Bromodichloromethane	1.0	ug/L	1.0	-	U	Yes
Bromoform	1.0	ug/L	1.0	-	U	Yes
2-Butanone (MEK)	5.0	ug/L	1.0	-	U	Yes
Carbon disulfide	2.0	ug/L	1.0	-	U	Yes
Carbon tetrachloride	1.0	ug/L	1.0	-	U	Yes
Chlorobenzene	0.55	ug/L	1.0	J	UJ	Yes
Chloroethane	2.0	ug/L	1.0	-	U	Yes
Chloroform	1.0	ug/L	1.0	-	U	Yes
Cyclohexane	1.0	ug/L	1.0	-	U	Yes
Dibromochloromethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dibromo-3-chloropropane	5.0	ug/L	1.0	-	U	Yes
1,2-Dibromoethane	2.0	ug/L	1.0	-	U	Yes
Dichlorodifluoromethane	1.2	ug/L	1.0	-	U	Yes
1,2-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,3-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,4-Dichlorobenzene	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
cis-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
trans-1,2-Dichloroethene	1.0	ug/L	1.0	-	U	Yes
1,2-Dichloropropane	1.0	ug/L	1.0	-	U	Yes

cis-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
trans-1,3-Dichloropropene	1.0	ug/L	1.0	-	U	Yes
Ethylbenzene	0.64	ug/L	1.0	J	UJ	Yes
Freon 113	1.0	ug/L	1.0	-	U	Yes
2-Hexanone	10	ug/L	1.0	-	U	Yes
Isopropylbenzene	2.4	ug/L	1.0	-	-	Yes
p-Isopropyltoluene	1.0	ug/L	1.0	-	U	Yes
Methyl Acetate	20	ug/L	1.0	-	U	Yes
Methyl Bromide	2.0	ug/L	1.0	-	U	Yes
Methyl Chloride	2.0	ug/L	1.0	-	U	Yes
Methylcyclohexane	1.0	ug/L	1.0	-	U	Yes
Methylene chloride	5.0	ug/L	1.0	-	U	Yes
4-Methyl-2-pentanone(MIBK)	5.0	ug/L	1.0	-	U	Yes
Methyl Tert Butyl Ether	2.4	ug/L	1.0	-	-	Yes
Styrene	1.0	ug/L	1.0	-	U	Yes
Tert-Amyl Alcohol	20	ug/L	1.0	-	U	Yes
Tert-Butyl Alcohol	20	ug/L	1.0	-	U	Yes
1,1,2,2-Tetrachloroethane	1.0	ug/L	1.0	-	U	Yes
Tetrachloroethene	1.0	ug/L	1.0	-	U	Yes
Tetrahydrofuran	5.0	ug/L	1.0	-	U	Yes
Toluene	1.0	ug/L	1.0	-	U	Yes
1,2,3-Trichlorobenzene	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trichlorobenzene	2.0	ug/L	1.0	-	U	Yes
1,1,1-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
1,1,2-Trichloroethane	1.0	ug/L	1.0	-	U	Yes
Trichloroethene	1.0	ug/L	1.0	-	U	Yes
Trichlorofluoromethane	2.0	ug/L	1.0	-	U	Yes
1,2,4-Trimethylbenzene	1.0	ug/L	1.0	-	U	Yes
Vinyl chloride	1.0	ug/L	1.0	-	U	Yes
m,p-Xylene	0.87	ug/L	1.0	J	UJ	Yes
o-Xylene	1.0	ug/L	1.0	-	U	Yes

DATA REVIEW WORKSHEETS

Project Number:_FA33878_____
Date:_____May_10-11,_2016_____
Shipping date:__May_11,_2016_____
EPA Region:_____2_____

REVIEW OF VOLATILE ORGANIC PACKAGE
Low/Medium Volatile Data Validation

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: USEPA **Hazardous Waste Support Section SOP No. HW-33A Revision 0 SOM02.2. Low/Medium Volatile Data Validation**. July, 2015. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) __Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: ____FA33878_____ Sample matrix: _Soil/Groundwater___
No. of Samples: _____6_____
Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:_____FA33878-2_____
Field duplicate No.:_____-_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

_OverallComments:___VOA_TCL_list_(SW846_8260C)_____
_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:___May_30,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
Samples analyzed within method recommended holding time. Sample preservation within required criteria.				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4$\pm$ 2°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 14 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 3.8° C - OK

Actions

Aqueous samples

a. If there is no evidence that the samples were properly preserved (pH < 2, T = 4°C ± 2°C), but the samples were analyzed within the technical holding time [7 days from sample collection], no qualification of the data is necessary.
b. If there is no evidence that the samples were properly preserved, and the samples were analyzed outside of the technical holding time [7 days from sample collection], qualify detects for all volatile compounds as estimated (J) and non-detects as unusable (R).
c. If the samples were properly preserved, and the samples were analyzed within the technical holding time [14 days from sample collection], no qualification of the data is necessary.
d. If the samples were properly preserved, but were analyzed outside of the technical holding time [14 days from sample collection], qualify detects as estimated (J) and non-detects as unusable (R).
e. If air bubbles were present in the sample vial used for analysis, qualify detected compounds as estimated (J-) and non-detected compounds as estimated (UJ).

Non-aqueous samples

a. If there is no evidence that the samples were properly preserved (T < -7°C or T = 4°C ± 2°C and preserved with $NaHSO_4$), but the samples were analyzed within the technical holding time [14 days from sample collection], qualify detects for all volatile compounds as estimated (J) and non-detects as (UJ) or unusable (R) using professional judgment.

b. If the samples were properly preserved, and the samples were analyzed within the technical holding time [14 days from sample collection], no qualification of the data is necessary.

c. If there is no evidence that the samples were properly preserved, and the samples were analyzed outside of the technical holding time [14 days from sample collection], qualify detects for all volatile compounds as estimated (J) and non-detects as unusable (R).

d. If the samples were properly preserved, but were analyzed outside of the technical holding time [14 days from sample collection], qualify detects as estimated (J) and non-detects as unusable (R).

Qualify TCLP/SPLP samples

a. If the TCLP/SPLP ZHE procedure is performed within the extraction technical holding time of 14 days, detects and non-detects should not be qualified.

b. If the TCLP/SPLP ZHE procedure is performed outside the extraction technical holding time of 14 days, qualify detects as estimated (J) and non-detects as unusable (R).

c. If TCLP/SPLP aqueous samples and TCLP/SPLP leachate samples are analyzed within the technical holding time of 7 days, detects and non-detects should not be qualified.

d. If TCLP/SPLP aqueous samples and TCLP/SPLP leachate samples are analyzed outside of the technical holding time of 7 days, qualify detects as estimated (J) and non-detects as unusable (R).

Table 1. Holding Time Actions for Low/Medium Volatile Analyses - Summary

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤ 7 days	No qualification	
	No	> 7 days	J	R
	Yes	≤ 14 days	No qualification	
	Yes	> 14 days	J	R
Non-Aqueous	No	≤ 14 days	J	Professional judgment, UJ or R
	Yes	≤ 14 days	No qualification	
	Yes/No	> 14 days	J	R
TCLP/SPLP	Yes	≤ 14 days	No qualification	
TCLP/SPLP	No	> 14 days	J	R
TCLP/SPLP	ZHE performed within the 14-day technical holding time		No qualification	
TCLP/SPLP	ZHE performed outside the 14-day technical holding time		J	R
TCLP/SPLP aqueous & TCLP/SPLP leachate	Analyzed within 7 days		No qualification	
TCLP/SPLP aqueous & TCLP/SPLP leachate	Analyzed outside 7 days		J	R
Sample temperature outside 4°C ± 2°C upon receipt at the laboratory			Use professional judgment	
Holding times grossly exceeded			J	R

All criteria were met __X__
Criteria were not met see below ____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__X___ The BFB performance results were reviewed and found to be within the specified criteria.

__X___ BFB tuning was performed for every 12 hours of sample analysis.

NOTES: All mass spectrometer instrument conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortions for the sole purpose of meeting the method specifications are contrary to the Quality Assurance (QA) objectives, and are therefore unacceptable.

NOTES: No data should be qualified based on BFB failure. Instances of this should be noted in the narrative.

All ion abundance ratios must be normalized to m/z 95, the nominal base peak, even though the ion abundance of m/z 174 may be up to 120% that of m/z 95.

Actions:

If samples are analyzed without a preceding valid instrument performance check, qualify all data in those samples as unusable (R).

If ion abundance criteria are not met, professional judgment may be applied to determine to what extent the data may be utilized. When applying professional judgment to this topic, the most important factors to consider are the empirical results that are relatively insensitive to location on the chromatographic profile and the type of instrumentation. Therefore, the critical ion abundance criteria for BFB are the m/z 95/96, 174/175, 174/176, and 176/177 ratios. The relative abundances of m/z 50 and 75 are of lower importance. This issue is more critical for Tentatively Identified Compounds (TICs) than for target analytes.

Note: State in the Data Review Narrative, decisions to use analytical data associated with BFB instrument performance checks not meeting contract requirements.

Note: Verify that that instrument instrument performance check criteria were achieved using techniques described in Low/Medium Volatiles Organic Analysis, Section II.D.5 of the SOM02.2 NFG, obtain additional information on the instrument performance checks. Make sure that background subtraction was performed from the BFB peak and not from background subtracting from the solvent front or from another region of the chromatogram.

Use professional judgment to determine whether associated data should be qualified based on the spectrum of the mass calibration compound.

List the samples affected:

If mass calibration is in error, all associated data are rejected.

All criteria were met __X__
Criteria were not met
and/or see below ____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____05/12/16_____	___05/12/16_____
Dates of continuing (initial) calibration:_05/12/16_____	___05/12/16_____
Dates of continuing calibration:__05/12/16;_05/13/16___	_____-_____
Dates of continuing calibration:__05/12/16;_05/13/16___	___05/12/16_____
Instrument ID numbers:_____GCMSJ_____	___GCMSC_____
Matrix/Level:_____Aqueous/low_____	__Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED

Note: Initial calibration, initial calibration verification, and continuing calibration verification within the validation guidance document required criteria. Closing calibration check verification included in data package.

Criteria

The analyte calibration criteria in the following Table must be obtained. Analytes not meeting the criteria are qualified.

A separate worksheet should be filled for each initial curve

Initial Calibration - **Table 2. RRF, %RSD, and %D Acceptance Criteria for Initial Calibration and CCV for Low/Medium Volatile Analysis**

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Closing Maximum %D
Dichlorodifluoromethane	0.010	25.0	±40.0	±50.0
Chloromethane	0.010	20.0	±30.0	±50.0
Vinyl chloride	0.010	20.0	±25.0	±50.0
Bromomethane	0.010	40.0	±30.0	±50.0
Chloroethane	0.010	40.0	±25.0	±50.0
Trichlorofluoromethane	0.010	40.0	±30.0	±50.0
1,1-Dichloroethene	0.060	20.0	±20.0	±25.0
1,1,2-Trichloro-1,2,2-trifluoroethane	0.050	25.0	±25.0	±50.0
Acetone	0.010	40.0	±40.0	±50.0
Carbon disulfide	0.100	20.0	±25.0	±25.0
Methyl acetate	0.010	40.0	±40.0	±50.0
Methylene chloride	0.010	40.0	±30.0	±50.0
trans-1,2-Dichloroethene	0.100	20.0	±20.0	±25.0
Methyl tert-butyl ether	0.100	40.0	±25.0	±50.0
1,1-Dichloroethane	0.300	20.0	±20.0	±25.0
cis-1,2-Dichloroethene	0.200	20.0	±20.0	±25.0
2-Butanone	0.010	40.0	±40.0	±50.0
Bromochloromethane	0.100	20.0	±20.0	±25.0
Chloroform	0.300	20.0	±20.0	±25.0
1,1,1-Trichloroethane	0.050	20.0	±25.0	±25.0
Cyclohexane	0.010	40.0	±25.0	±50.0
Carbon tetrachloride	0.100	20.0	±25.0	±25.0
Benzene	0.200	20.0	±20.0	±25.0
1,2-Dichloroethane	0.070	20.0	±20.0	±25.0
Trichloroethene	0.200	20.0	±20.0	±25.0
Methylcyclohexane	0.050	40.0	±25.0	±50.0
1,2-Dichloropropane	0.200	20.0	±20.0	±25.0
Bromodichloromethane	0.300	20.0	±20.0	±25.0
cis-1,3-Dichloropropene	0.300	20.0	±20.0	±25.0
4-Methyl-2-pentanone	0.030	25.0	±30.0	±50.0
Toluene	0.300	20.0	±20.0	±25.0
trans-1,3-Dichloropropene	0.200	20.0	±20.0	±25.0
1,1,2-Trichloroethane	0.200	20.0	±20.0	±25.0
Tetrachloroethene	0.100	20.0	±20.0	±25.0
2-Hexanone	0.010	40.0	±40.0	±50.0
Dibromochloromethane	0.200	20.0	±20.0	±25.0
1,2-Dibromoethane	0.200	20.0	±20.0	±25.0
Chlorobenzene	0.400	20.0	±20.0	±25.0
Ethylbenzene	0.400	20.0	±20.0	±25.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Closing Maximum
m,p-Xylene	0.200	20.0	±20.0	±25.0
o-Xylene	0.200	20.0	±20.0	±25.0
Styrene	0.200	20.0	±20.0	±25.0
Bromoform	0.100	20.0	±25.0	±50.0
Isopropylbenzene	0.400	20.0	±25.0	±25.0
1,1,2,2-Tetrachloroethane	0.200	20.0	±25.0	±25.0
1,3-Dichlorobenzene	0.500	20.0	±20.0	±25.0
1,4-Dichlorobenzene	0.600	20.0	±20.0	±25.0
1,2-Dichlorobenzene	0.600	20.0	±20.0	±25.0
1,2-Dibromo-3-chloropropane	0.010	25.0	±30.0	±50.0
1,2,4-Trichlorobenzene	0.400	20.0	±30.0	±50.0
1,2,3-Trichlorobenzene	0.400	25.0	±30.0	±50.0
Deuterated Monitoring Compound				
Vinyl chloride-d_3	0.010	20.0	±30.0	±50.0
Chloroethane-d_5	0.010	40.0	±30.0	±50.0
1,1-Dichloroethene-d_2	0.050	20.0	±25.0	±25.0
2-Butanone-d_5	0.010	40.0	±40.0	±50.0
Chloroform-d	0.300	20.0	±20.0	±25.0
1,2-Dichloroethane-d_4	0.060	20.0	±25.0	±25.0
Benzene-d_6	0.300	20.0	±20.0	±25.0
1,2-Dichloropropane-d_6	0.200	20.0	±20.0	±25.0
Toluene-d_8	0.300	20.0	±20.0	±25.0
trans-1,3-Dichloropropene-d_4	0.200	20.0	±20.0	±25.0
2-Hexanone-d_5	0.010	40.0	±40.0	±50.0
1,1,2,2-Tetrachloroethane-d_2	0.200	20.0	±25.0	±25.0
1,2-Dichlorobenzene-d_4	0.400	20.0	±20.0	±25.0

[1] If a closing CCV is acting as an opening CCV, all target analytes and DMCs must meet the requirements for an opening CCV.

Actions:

1. If any volatile target compound has an RRF value less than the minimum in the table, use professional judgment for detects, based on mass spectral identification, to qualify the data as estimated (J+ or R).
   a. If any volatile target compound has an RRF value less than the minimum criterion, qualify non-detected compounds as unusable (R).
   b. If any of the volatile target compounds listed in the Table has %RSD greater than the criteria, qualify detects as estimated (J), and non-detected compounds using professional judgment.
   c. If the volatile target compounds meet the acceptance criteria for RRF and the %RSD, no qualification of the data is necessary.

d. No qualification of the data is necessary on the DMC RRF and %RSD data alone. Use professional judgment and follow the guidelines in Action 2 to evaluate the DMC RRF and %RSD data in conjunction with the DMC recoveries to determine the need for qualification of data.

2. At the reviewer's discretion, and based on the project-specific Data Quality Objectives (DQOs), a more in-depth review may be considered using the following guidelines:
   a. If any volatile target compound has a %RSD greater than the maximum criterion in the Table, and if eliminating either the high or the low-point of the curve does not restore the %RSD to less than or equal to the required maximum:
      i. Qualify detects for that compound(s) as estimated (J).
      ii. Qualify non-detected volatile target compounds using professional judgment.
   b. If the high-point of the curve is outside of the linearity criteria (e.g., due to saturation):
      i. Qualify detects outside of the linear portion of the curve as estimated (J).
      ii. No qualifiers are required for detects in the linear portion of the curve.
      iii. No qualifiers are required for volatile target compounds that were not detected.
   c. If the low-point of the curve is outside of the linearity criteria:
      i. Qualify low-level detects in the area of non-linearity as estimated (J).
      ii. No qualifiers are required for detects in the linear portion of the curve.
      iii. For non-detected volatile compounds, use the lowest point of the linear portion of the curve to determine the new quantitation limit.

Note: If the laboratory has failed to provide adequate calibration information, inform the Region's designated representative to contact the laboratory and request the necessary information. If the information is not available, the reviewer must use professional judgment to assess the data.

State in the Data Review Narrative, if possible, the potential effects on the data due to calibration criteria exceedance.

Note, for the Laboratory COR action, if calibration criteria are grossly exceeded.

Table. Initial Calibration Actions for Low/Medium Volatile Analysis – Summary

Criteria	Action	
	Detect	Non-detect
Initial Calibration not performed at specified frequency and sequence	Use professional judgment R	Use professional judgment R
Initial Calibration not performed at the specified concentrations	J	UJ
RRF < Minimum RRF in Table for target analyte	Use professional judgment J+ or R	R
RRF > Minimum RRF in Table for target analyte	No qualification	No qualification
%RSD > Maximum %RSD in Table for target analyte	J	Use professional judgment
%RSD ≤ Maximum %RSD in Table for target analyte	No qualification	No qualification

All criteria were met __X___
Criteria were not met
and/or see below _____

Continuing Calibration Verification (CCV)

NOTE: Verify that the CCV was run at the required frequency (an opening and closing CCV must be run within 12-hour period) and the CCV was compared to the correct initial calibration. If the mid-point standard from the initial calibration is used as an opening CCV, verify that the result (RRF) of the mid-point standard was compared to the average RRF from the correct initial calibration.

The closing CCV used to bracket the end of a 12-hour analytical sequence may be used as the opening CCV for the new 12-hour analytical sequence, provided that all the technical acceptance criteria are met for an opening CCV (see criteria show before in the Table) . If the closing CCV does not meet the technical acceptance criteria for an opening CCV, then a BFB tune followed by an opening CCV is required and the next 12-hour time period begins with the BFB tune.

All DMCs must meet RRF criteria. No qualification of the data is necessary on the DMCs RRF and %RSD/%D data alone. However, use professional judgment to evaluate the DMC and %RSD/%D data in conjunction with the DMC recoveries to determine the need of qualification the data.

Action:

1. If a CCV (opening and closing) was not run at the appropriate frequency, qualify data using professional judgment.

2. Qualify all volatile target compounds in Table shown before using the following criteria:

   a. For an opening CCV, if any volatile target compound has an RRF value less than the minimum criterion, use professional judgment for detects, based on mass spectral identification, to qualify the data as estimated (J) and qualify non-detected compounds as unusable (R).
   b. For a closing CCV, if any volatile target compound has an RRF value less than the criteria, use professional judgment for detects based on mass spectral identification to qualify the data as estimated (J), and qualify non-detected compounds as unusable (R).
   c. For an opening CCV, if the Percent Difference value for any of the volatile target compounds is outside the limits in calibration criteria Table shown before, qualify detects as estimated (J) and non-detected compounds as estimated (UJ).
   d. For a closing CCV, if the Percent Difference value for any volatile target compound is outside the limits in calibration criteria table, qualify detects as estimated (J) and non-detected compounds as estimated (UJ).
   e. If the volatile target compounds meet the acceptable criteria for RRF and the Percent Difference, no qualification of the data is necessary.

f. No qualification of the data is necessary on the DMC RRF and the Percent Difference data alone. Use professional judgment to evaluate the DMC RRF and Percent Difference data in conjunction with the DMC recoveries to determine the need for qualification of data.

Notes: If the laboratory has failed to provide adequate calibration information, inform the Region's designated representative to contact the laboratory and request the necessary information. If the information is not available, the reviewer must use professional judgment to assess the data.

State in the Data Review Narrative, if possible, the potential effects on the data due to calibration criteria exceedance.

Note, for Contract Laboratory COR action, if calibration criteria are grossly exceeded.

Table. Continuing Calibration Actions for Low/Medium Volatile Analysis – Summary

Criteria for Opening CCV	Criteria for Closing CCV	Action	
		Detect	Non-detect
CCV not performed at required frequency	CCV not performed at required frequency	Use professional judgment R	Use professional judgment R
CCV not performed at specified concentration	CCV not performed at specified concentration	Use professional judgment	Use professional judgment
RRF < Minimum RRF in Table 2 for target analyte	RRF < Minimum RRF in Table for target analyte	Use professional judgment J or R	R
RRF ≥ Minimum RRF in Table 2 for target analyte	RRF ≥ Minimum RRF in Table for target analyte	No qualification	No qualification
%D outside the Opening Maximum %D limits in Table 2 for target analyte	%D outside the Closing Maximum %D limits in Table for target analyte	J	UJ
%D within the inclusive Opening Maximum %D limits in Table 2 for target analyte	%D within the inclusive Closing Maximum %D limits in Table for target analyte	No qualification	No qualification

All criteria were met ___X___
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

The concentration of a target analyte in any blank must not exceed its Contract Required Quantitation Limit (CRQL) (2x CRQLs for Methylene chloride, Acetone, and 2-Butanone). TIC concentration in any blanks must be ≤ 5.0 µg/L for water (0.0050 mg/L for TCLP leachate) and ≤ 5.0 µg/kg for soil matrices.

Laboratory blanks

The method blank, like any other sample in the SDG, must meet the technical acceptance criteria for sample analysis.

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_05/12/16_____	_VJ5295-MB__	_Aq./low____	_1,2,3-trichlorobenzene_____	__0.68_ug/l____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

_No_target_analyte_detected_in_method_blanks_except_in_the_case_described_above._No____
_action_taken,_analyte_not_found_in_any_of_the_sample_above_reporting_limit._____

Field/Equipment/Trip blank

If field or trip blanks are present, the data reviewer should evaluate this data in a similar fashion as the method blanks.

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_No_target_analytes_detected_in_the_equipment_blank_analyzed_for_this_data_package._No__
_field/trip_blanks_analyzed_included_in_this_data_package._____
_____
_____
_____
_____
_____

All criteria were met __X___
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Note: All fields blank results associated with a particular group of samples (may exceed one per case) must be used to qualify data. Trip blanks are used to qualify only those samples with which they were shipped. Blanks may not be qualified because of contamination in another blank. Field blanks and trip blanks must be qualified for system monitoring compounds, instrument performance criteria, and spectral or calibration QC problems.

Samples taken from a drinking water tap do not have associated field blanks.

When applied as described in the Table below, the contaminant concentration in the blank is multiplied by the sample dilution factor.

Table. Blank and TCLP/SPLP LEB Actions for Low/Medium Volatile Analysis

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, TCLP/SPLP LEB, Instrument**	Detects	Not detected	No qualification required
	< CRQL *	< CRQL*	Report CRQL value with a U
		≥ CRQL*	No qualification required
	> CRQL *	< CRQL*	Report CRQL value with a U
		≥ CRQL* and ≤ blank concentration	Report blank value for sample concentration with a U
		≥ CRQL* and > blank concentration	No qualification required
	= CRQL*	≤ CRQL*	Report CRQL value with a U
		> CRQL*	No qualification required
	Gross contamination	Detects	Report blank value for sample concentration with a U

* 2x the CRQL for methylene chloride, 2-butanone and acetone.
** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 µg/L.

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

DATA REVIEW WORKSHEETS

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below ____

DEUTERATED MONITORING COMPOUNDS (DMCs)

Laboratory performance of individual samples is established by evaluation of surrogate spike (DMCs) recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

Table. Volatile Deuterated Monitoring Compounds (DMCs) and Recovery Limits

DMC	%R for Water Sample	%R for Soil Sample
Vinyl chloride-d3	60-135	30-150
Chloroethane-d5	70-130	30-150
1,1-Dichloroethene-d2	60-125	45-110
2-Butanone-d5	40-130	20-135
Chloroform-d	70-125	40-150
1,2-Dichloroethane-d4	70-125	70-130
Benzene-d6	70-125	20-135
1,2-Dichloropropane-d6	70-120	70-120
Toluene-d8	80-120	30-130
trans-1,3-Dichloropropene-d4	60-125	30-135
2-Hexanone-d5	45-130	20-135
1,1,2,2-Tetrachloroethane-d2	65-120	45-120
1,2-Dichlorobenzene-d4	80-120	75-120

NOTE: The recovery limits for any of the compounds listed in the above Table may be expanded at any time during the period of performance if the United States Environmental Protection Agency (EPA) determines that the limits are too restrictive.

Action:

Are recoveries for DMCs in volatile samples and blanks must be within the limits specified in the Table above. **Yes**? or No?

NOTE: The recovery limits for any of the compounds listed in the Table above may be expanded at any time during the period of performance if USEPA determines that the limits are too restrictive.

DATA REVIEW WORKSHEETS

List the DMCs that may fail to meet the recovery limits

Sample ID	Date	DMCs	% Recovery	Action

DMCs recoveries within the required limits. Other non-deuterated surrogates added to the samples within laboratory control limits.

Note: Any sample which has more than 3 DMCs outside the limits must be reanalyzed.

Action:

1. For any recovery greater than the upper acceptance limit:
   a. Qualify detected associated volatile target compounds as estimated high (J+).
   b. Do not qualify non-detected associated volatile target compounds.
2. For any recovery greater than or equal to 10%, and less than the lower acceptance limit:
   a. Qualify detected associated volatile target compounds as estimated low (J-).
   b. Qualify non-detected associated volatile target compounds as estimated (UJ).
3. For any recovery less than 10%:
   a. Qualify detected associated volatile target compounds as estimated low (J-).
   b. Qualify non-detected associated volatile target compounds as unusable (R).
4. For any recovery within acceptance limits, no qualification of the data is necessary.
5. In the special case of a blank analysis having DMCs out of specification, the reviewer must give special consideration to the validity of associated sample data. The basic concern is whether the blank problems represent an isolated problem with the blank alone, or whether there is a fundamental problem with the analytical process. For example, if one or more samples in the batch show acceptable DMC recoveries, the reviewer may choose to consider the blank problem to be an isolated occurrence. However, even if this judgment allows some use of the affected data, note analytical problems for Contract Laboratory COR action.
6. If more than three DMCs are outside of the recovery limits for Low/Medium volatiles analysis and the sample was not reanalyzed, note under Contract Problems/Non-Compliance.

Table. Deuterated Monitoring Compound (DMC) Recovery Actions for Low/Medium Volatiles Analyses – Summary

Criteria	Action	
	Detect Associated Compounds	Non-detected Associated Compounds
%R < 10%	J-	R
10% ≤ %R < Lower Acceptance Limit	J-	UJ
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualification	No qualification
%R > Upper Acceptance Limit	J+	No qualification

TABLE. VOLATILE DEUTERATED MONITORING COMPOUNDS (DMCs) AND THE ASSOCIATED TARGET COMPOUNDS

Vinyl chloride-d_3 (DMC-1)	**Chloroethane-d_5 (DMC-2)**	**1,1-Dichloroethene-d_2 (DMC-3)**
Vinyl chloride	Dichlorodifluoromethane Chloromethane Bromomethane Chloroethane Carbon disulfide	trans-1,2-Dichloroethene cis-1,2-Dichloroethene 1,1-Dichloroethene
2-Butanone-d_5 (DMC-4)	**Chloroform-d (DMC-5)**	**1,2-Dichloroethane-d_4 (DMC-6)**
Acetone 2-Butanone	1,1-Dichloroethane Bromochloromethane Chloroform Dibromochloromethane Bromoform	Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane Methyl acetate Methylene chloride Methyl-tert-butyl ether 1,1,1-Trichloroethane Carbon tetrachloride 1,2-Dibromoethane 1,2-Dichloroethane
Benzene-d_6 (DMC-7)	**1,2-Dichloropropane-d_6 (DMC-8)**	**Toluene-d_8 (DMC-9)**
Benzene	Cyclohexane Methylcyclohexane 1,2-Dichloropropane Bromodichloromethane	Trichloroethene Toluene Tetrachloroethene Ethylbenzene o-Xylene m,p-Xylene Styrene Isopropylbenzene
trans-1,3-Dichloropropene-d_4 (DMC-10)	**2-Hexanone-d_5 (DMC-11)**	**1,1,2,2-Tetrachloroethane-d_2 (DMC-12)**
cis-1,3-Dichloropropene trans-1,3-Dichloropropene 1,1,2-Trichloroethane	4-Methyl-2-pentanone 2-Hexanone	1,1,2,2,-Tetrachloroethane 1,2-Dibromo-3-chloropropane
1,2-Dichlorobenzene-d_4 (DMC-13)		
Chlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene		

All criteria were met ___X___
Criteria were not met
and/or see below _____

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

NOTES: Data for MS and MSDs will not be present unless requested by the Region.
Notify the Contract Laboratory COR if a field or trip blank was used for the MS and MSD.

For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:_ FA33788-8MS/8MSD_____ Matrix/Level:_____Soil_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
_MS/MSD_____	Acetone_____	57/59_%	_____	61___155	See_below_____
_____	Carbon_disulfide_____	66/68_%	_____	72_-_122	_____
_____	Chloroethane_____	35/35_%	_____	68_-_133	_____
_____	1,1-Dichloroethylene____	70/71_%	_____	81_-_136	_____
_MS_____	Freon_113_____	70_%	_____	71_-_129	_____
_MS/MSD_____	Methyl_Bromide_____	60/62_%	_____	65_-_139	_____
_MSD_____	Methylene_Chloride_____	72_%	_____	74_-_137	_____
_MS_____	tert-Amyl_Alcohol_____	213_%	76_%	69_-_130/32	_____
_MS/MSD_____	tert-Butyl_Alcohol____	182/133_%	_____	74_-_126	_____
_____	Trichlorofluoromethane____	25/30_%	_____	73_-_145	_____

Note: MS/MSD results apply only to the unspiked sample. MS/MSD sample from another project. No action taken, professional judgment.

Sample ID:_ FA33878-1MS/1MSD_____ Matrix/Level:_____Aqueous_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
_MS/MSD	Ethylbenzene	134/125	_%	81_-_121	See_below
	tert-Butyl_Alcohol	137/146	_%	63_-_129	

Note: Analytes over the recovery upper control limit qualified as estimated (J) for positive results, non-detects are accepted.

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

1. No qualification of the data is necessary on MS and MSD data alone. However, using professional judgment, the validator may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___Recoveries_(blank_spike)_within_laboratory_control_limits_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met __X___
Criteria were not met
and/or see below _____

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs: _____-_____ Matrix:_____-_____

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.

> **NOTE:** In the absence of QAPP guidance for validating data from field duplicates, the following action will be taken.

Identify which samples within the data package are field duplicates. Estimate the relative percent difference (RPD) between the values for each compound. Use professional judgment to note large RPDs (> 50%) in the narrative.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed for this data package. MS/MSD RPD used to assess precision. RPD within required criteria, < 50 % for target analytes.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions are suggested based on professional judgment:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __X__
Criteria were not met
and/or see below ____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Internal standard area counts within the required criteria.

Action:

1. If an internal standard area count for a sample or blank is greater than 200.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration) (see Table below):
   a. Qualify detects for compounds quantitated using that internal standard as estimated low (J-).
   b. Do not qualify non-detected associated compounds.
2. If an internal standard area count for a sample or blank is less than 20.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration):
   a. Qualify detects for compounds quantitated using that internal standard as estimated high (J+).
   b. Qualify non-detected associated compounds as unusable (R).
3. If an internal standard area count for a sample or blank is greater than or equal to 20.0%, and less than or equal to 200% of the area for the associated standard opening CCV or mid-point standard from initial calibration, no qualification of the data is necessary.
4. If an internal standard RT varies by more than 30.0 seconds: Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.
5. If an internal standard RT varies by less than or equal to 30.0 seconds, no qualification of the data is necessary.

Note: Inform the Contract Laboratory Program Project Officer (CLP PO) if the internal standard performance criteria are grossly exceeded. Note in the Data Review Narrative potential effects on the data resulting from unacceptable internal standard performance.

6. If required internal standard compounds are not added to a sample or blank, qualify detects and non-detects as unusable (R).
7. If the required internal standard compound is not analyzed at the specified concentration in a sample or blank, use professional judgment to qualify detects and non-detects.

Table. Internal Standard Actions for Low/Medium Volatiles Analyses - Summary

Criteria	Action	
	Detected Associated Compounds*	Non-detected Associated Compounds*
Area counts > 200% of 12-hour standard (opening CCV or mid-point standard from initial calibration)	J-	No qualification
Area counts < 20% of 12-hour standard (opening CCV or mid-point standard from initial calibration)	J+	R
Area counts ≥ 50% but ≤ 200% of 12-hour standard (opening CCV or mid-point standard from initial calibration)	No qualification	
RT difference > 30.0 seconds between samples and 12-hour standard (opening CCV or mid-point standard from initial calibration)	R **	R
RT difference ≤ 30.0 seconds between samples and 12-hour standard (opening CCV or mid-point standard from initial calibration)	No qualification	

* For volatile compounds associated to each internal standard, see TABLE - VOLATILE TARGET ANALYTES, DEUTERATED MONITORING COMPOUNDS WITH ASSOCIATED INTERNAL STANDARDS FOR QUANTITATION in SOM02.2, Exhibit D, available at: http://www.epa.gov/superfund/programs/clp/download/som/som22d.pdf

** Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.

All criteria were met __X__
Criteria were not met
and/or see below ____

TARGET COMPOUND IDENTIFICATION

Criteria:

Is the Relative Retention Times (RRTs) of reported compounds within ±0.06 RRT units of the standard RRT [opening Continuing Calibration Verification (CCV) or mid-point standard from the initial calibration]. **Yes**? or No?

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions

Mass spectra of the sample compound and a current laboratory-generated standard [i.e., the mass spectrum from the associated calibration standard (opening CCV or mid-point standard from initial calibration)] must match according to the following criteria:

a. All ions present in the standard mass spectrum at a relative intensity greater than 10% must be present in the sample spectrum.

b. The relative intensities of these ions must agree within ±20% between the standard and sample spectra (e.g., for an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance must be between 30-70%).

c. Ions present at greater than 10% in the sample mass spectrum, but not present in the standard spectrum, must be evaluated by a reviewer experienced in mass spectral interpretation.

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions

Action:

1. The application of qualitative criteria for GC/MS analysis of target compounds requires professional judgment. It is up to the reviewer's discretion to obtain additional information from the laboratory. If it is determined that incorrect identifications were made, qualify all such data as unusable (R).

2. Use professional judgment to qualify the data if it is determined that cross-contamination has occurred.

3. Note in the Data Review Narrative any changes made to the reported compounds or concerns regarding target compound identifications. Note, for Contract Laboratory COR action, the necessity for numerous or significant changes.

TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

NOTE: Tentatively identified compounds should only be evaluated when requested by a party from outside of the Hazardous Waste Support Section (HWSS).

List TICs

Sample ID	Compound	Sample ID	Compound

Action:

1. Qualify all TIC results for which there is presumptive evidence of a match (e.g. greater than or equal to 85% match) as tentatively identified (NJ), with approximated concentrations. TICs labeled "unknown" are qualified as estimated (J).
2. General actions related to the review of TIC results are as follows:
   a. If it is determined that a tentative identification of a non-target compound is unacceptable, change the tentative identification to "unknown" or another appropriate identification, and qualify the result as estimated (J).
   b. If all contractually-required peaks were not library searched and quantitated, the Region's designated representative may request these data from the laboratory.
3. In deciding whether a library search result for a TIC represents a reasonable identification, use professional judgment. If there is more than one possible match, report the result as "either compound X or compound Y". If there is a lack of isomer specificity, change the TIC result to a nonspecific isomer result (e.g., 1,3,5-trimethyl benzene to trimethyl benzene

isomer) or to a compound class (e.g., 2-methyl, 3-ethyl benzene to a substituted aromatic compound).

4. The reviewer may elect to report all similar compounds as a total (e.g., all alkanes may be summarized and reported as total hydrocarbons).
5. Target compounds from other fractions and suspected laboratory contaminants should be marked as "non-reportable".
6. Other Case factors may influence TIC judgments. If a sample TIC match is poor, but other samples have a TIC with a valid library match, similar RRT, and the same ions, infer identification information from the other sample TIC results.
7. Note in the Data Review Narrative any changes made to the reported data or any concerns regarding TIC identifications.
8. Note, for Contract Laboratory COR action, failure to properly evaluate and report TICs

All criteria were met __X__
Criteria were not met
and/or see below _____

SAMPLE QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

Action:

1. If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.
2. For non-aqueous samples, in the percent moisture is less than 70.0%, no qualification of the data is necessary. If the percent moisture is greater than or equal to 70.0% and less than 90.0%, qualify detects as estimated (J) and non-detects as approximated (UJ). If the percent moisture is greater than or equal to 90.0%, qualify detects as estimated (J) and non-detects as unusable (R) (see Table below).
3. Note, for Contract Laboratory COR action, numerous or significant failures to accurately quantify the target compounds or to properly evaluate and adjust CRQLs.
4. Results between MDL and CRQL should be qualified as estimated "J".
5. Results < MDL should be reported at the CRQL and qualified "U". MDLs themselves are not reported.

Table. Percent Moisture Actions for Low/Medium Volatiles Analysis for Non-Aqueous Samples

Criteria	**Action**	
	Detected Associated Compounds	**Non-detected Associated Compounds**
% Moisture < 70.0	No qualification	
70.0 < % Moisture < 90.0	J	UJ
% Moisture > 90.0	J	R

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Sample ID

FA33878-3 Ethylbenzene RF = 1.773

[ ] = (1925448)(50)/(1.773)(975370) = 55.67 ppb Ok

B. Percent Solids

List samples which have ≥ 70 % solids

All criteria were met __X__
Criteria were not met
and/or see below _____

QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
FA33875-5	100 X	Ethylbenzene; m- + p-xylenes; and o-xylene over calibration range

All criteria were met __X__
Criteria were not met
and/or see below ____

OTHER ISSUES

A. System Performance

List samples qualified based on the degradation of system performance during simple analysis:

Sample ID	Comments	Actions
_____	_____	_____
_No_degradation_of_system_performance_observed.		_____
_____	_____	_____
_____	_____	_____

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Inform the Contract Laboratory Program COR any action as a result of degradation of system performance which significantly affected the data.

B. Overall Assessment of Data

List samples qualified based on other issues:

Sample ID	Comments	Actions
_____	_____	_____
_No_additional_issues_observed_that_require_qualification_of_the_data._Results_are_valid_and_ _can_be_used_for_decission_purposes._____		_____
_____	_____	_____
_____	_____	_____

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Inform the Contract Laboratory COR the action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).